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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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EXAMINER

VIGUSHIN, J

ART UNIT

PAPER NUMBER

2841

DATE MAILED:

01/11/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/531,285

Applicant(s)

Chen et al.

Examiner

John Vigushin

Group Art Unit

2841

☒ Responsive to communication(s) filed on Mar 20, 2000

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) 37-43 is/are pending in the application.

Of the above, claim(s) _____ is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 37-43 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☒ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☒ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been
☐ received.

☐ received in Application No. (Series Code/Serial Number) _____.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☒ Notice of References Cited, PTO-892

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 4

☐ Interview Summary, PTO-413

☒ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities:
 - a) In the insertion before the first line on p.1 that refers to the parent Application, please make the following amendment: after "allowed" insert --as U.S. Patent Number 6,063,647--.
 - b) On p.3, line 3: "5,502,884" should be changed to --5,502,889--.Appropriate correction is required.

Information Disclosure Statement

2. On p.3, line 3, the Applicant discusses the prior art patent awarded to Casson et al. but cites the wrong patent number. However, the Casson et al. US patent number is 5,502,889 and not "5,502,884" as cited by the Applicant (correction required as noted in section 1, above). Accordingly, the Examiner has not considered US 5,502,884 (Ladouceur), and has therefore lined through, its listing in Applicant's PTO-Form 1449 since it is not the patent the Applicant considered relevant to the instant Application. The Casson et al. patent (US 5,502,889), deemed relevant by the Applicant to the instant Application, has been added to the PTO-Form 1449 by the Examiner and a copy of the patent will be included with the present Office Action.

Claim Objections

3. Claims 37 and 38 are objected to because of the following informalities:

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In Claim 37, line 1: delete "in".

In Claim 37, line 8: --and-- should be inserted after "element".

In Claim 38, line 8: --;-- should replace ",", after the first occurrence of "surface". This makes it clear that it is what comes afterwards in lines 8-10 that defines the "major surface".

Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 37-43 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 37 recites the limitation "said insulating layer" in line 7. There is insufficient antecedent basis for this limitation in the claim. The rejection may be overcome by inserting --first-- before "insulating" in line 7.

Claim 37 recites the limitation "the precursor circuit element" in line 8. There is insufficient antecedent basis for this limitation in the claim. The rejection may be overcome by deleting "circuit" in line 8.

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Claim 37 recites the limitation "said insulating layer" in line 17. There is insufficient antecedent basis for this limitation in the claim. The rejection may be overcome by inserting -- first-- before "insulating" (first occurrence) in line 17.

Claim 38 recites the limitation "said at least one surface of said conductor" in lines 8-9. There is insufficient antecedent basis for this limitation in the claim because there is no antecedent basis for a *surface* of the "at least one conductor" (line 4). One possible amendment of the above-cited recitation in lines 8-9 could be the following: --said at least one [surface of said] conductor--.

Claims 39-43 depend from defective Claim 38 and therefore inherit the defects of the claim.

Rejections Based On Prior Art

6. The following references were relied upon for the rejections hereinbelow:

Scholz (US 5,329,423)

Akram et al. (US 5,956,605)

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371© of this title before the invention thereof by the applicant for patent.

8. Claims 37-42 are rejected under 35 U.S.C. 102(b) as being anticipated by Scholz.

A) As to Claim 37:

(1) Scholz discloses, in Fig. 3, a precursor element including a first insulating layer 52 having a first surface that defines a first surface plane, a first conductor 54 attached to the first insulating layer 52, precursor element having a surface that includes the first surface of first insulating layer 52; a conducting member 58 placed onto the precursor element and into electrical communication with first conductor 54; conducting member 58 having a surface and protruding to an apex at a first level at least beyond the first surface plane; precursor element surface and surface of conducting member 58 defining a major surface of a predetermined shape; a second insulating layer 78 placed onto substantially all of the major surface and including oppositely disposed portions extending laterally from conducting member 58 along the first surface of first insulating layer 52; the oppositely disposed portions of the second insulating layer 78 extending to a second level, the first level beyond the second level.

(2) Scholz further teaches that conducting member, bump 58, has an exposed surface proximate the (exposed) apex of the bump (Fig. 3). However, the limitation "removing at least a portion of said second insulating layer proximate the apex of said conducting member" (last two lines of the claim) is a *process* limitation in a product claim and cannot serve to

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patentably define the product over the prior art of record, in this case, Scholz. See Product-by-Process in MPEP § 2113 and 2173.05(p).

B) As to Claim 38, Scholz discloses, in Fig. 3, a first insulating layer 52 having a surface defining a first surface plane, at least one conductor 54 along the surface, conducting member 58 in communication with conductor 54, conducting member 58 protruding to an apex at a first level beyond the first surface plane of first insulating layer 52; conducting member 58 including a surface, i.e., the outer (exposed) surface (Fig. 3); the first insulating layer surface 52, the surface of conductor 54 and the surface of conducting member 58 together define a major surface of predetermined shape, i.e., rectangular, circular, polygonal, etc., only a part of which is shown in Fig. 3; the shape of (Fig. 3); a second insulating layer 78 (col.5: 52-53) along at least a portion of the major surface; at least a portion of conducting member 58 remains exposed (Fig. 3); second insulating layer 78 includes portions extending laterally from conducting member 58 along first insulating layer 52 (Fig. 3); the laterally extending portions extending from the first surface plane (of insulating layer 52) to a second level less than the first level (Fig. 3).

C) As to Claim 39, Scholz further discloses that the exposed portion of conducting member 58 is proximate the apex of member 58 (Fig. 3).

D) As to Claim 40, Scholz further discloses that the exposed portion of conducting member 58 includes the surface of the conducting member.

E) As to Claim 41, Scholz further discloses that at least a portion of second insulating layer 78 conforms to the predetermined shape of the major surface.

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F) As to Claim 42, Scholz further discloses that the laterally extending portions of second insulating layer 78 extend from the first surface plane (of insulating layer 52) to a second plane at the second level (Fig. 3).

9. Claims 37-42 are rejected under 35 U.S.C. 102(e) as being anticipated by Akram et al.

A) As to Claims 37 and 38:

(1) Akram et al. discloses, in Fig. 3, a first insulating layer 12 having a surface 18, at least a portion of which defines a first surface plane, conductor 14, conducting member 16 protruding to an apex at a first level (i.e., a height from surface 18 of first insulating layer 12); a major surface of predetermined shape defined by first insulating layer surface 18, surface of conductor 14 and surface of conducting member 16; a second insulating layer 22 along a at least a portion of major surface; at least a portion of conducting member 16 remains exposed; second insulating layer including portions extending laterally from conducting member 16 along insulating layer 12; laterally extending portions extending from the first surface plane to a second level (i.e., height from surface 18), the second level less than the first level.

(2) The limitation "removing at least a portion of said second insulating layer proximate the apex of said conducting member" (last two lines of the claim) is a *process* limitation in a product claim and **cannot serve to patentably define the product over the prior art of record**, in this case, Akram et al.. See Product-by-Process in MPEP § 2113 and 2173.05(p). It happens that Akram et al. also teaches the above-cited process step (Figs. 2 and 3; col.6: 49-53).

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B) As to Claim 39, Akram et al. further discloses that the exposed portion of conducting member 16 is proximate the apex (Fig. 3).

C) As to Claim 40, Akram et al. further discloses that the exposed portion of conducting member 16 includes the surface of the conducting member (Fig. 3).

D) As to Claim 41, Akram et al. further discloses that at least a portion of second insulating layer 22 conforms to the predetermined shape of the major surface (Fig. 3).

E) As to Claim 42, Akram et al. further discloses that the laterally extending portions of second insulating layer 22 extend from the first surface plane 18 to a second plane at the second level (Fig. 3).

Allowable Subject Matter

10. Claim 43 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

11. The following is a statement of reasons for the indication of allowable subject matter:

In Claim 43, patentability resides in the limitation wherein, *the second insulating layer includes an adhesive*, in combination with the other limitations of the claim.

12. As allowable subject matter has been indicated, applicant's reply must either comply with all formal requirements or specifically traverse each requirement not complied with. See 37 CFR 1.111(b) and MPEP § 707.07(a).

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Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a) The following references disclose partially exposed bump electrodes used as part of a multilayer circuit board structure:

Feldman (US 3,148,310: Figs. 5 and 7)

Abolafia et al. (US 3,795,047: Figs. 4 and 5)

Daigle et al. (US 5,046,238: Fig. 6).

b) The following references disclose partially exposed bump electrodes used as part of electronic device assemblies:

Rai et al. (US 4,818,728: Figs 1A,B,C)

Somaki et al. (US 5,641,113: Fig. 3).

c) Mori et al. (US 5,175,399) discloses, in Fig. 8, a wiring board having first and second insulating layers 1 and 3, respectively, and exposed conducting member 4a.

d) Liou (US 5,650,667) discloses a device with two insulating layers 10 and 22, respectively, wherein conducting members 16 protruding to an apex are exposed at the apex (Fig. 2e).

e) Tamura et al. discloses a first insulating layer 7, a second insulting layer 10 (Fig. 3C; col.5: 15) or 11 (Fig. 5B; col.5: 44-45) and exposed conducting members 9.

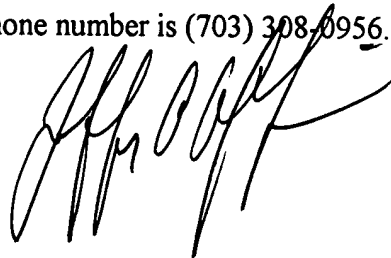
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14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to John Vigushin whose telephone number is (703) 308-1205. The examiner can normally be reached on Monday to Friday from 8:30AM to 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeffrey Gaffin, can be reached on (703) 308-3301. The fax phone number for the organization where this application or proceeding is assigned is (703) 308-7382.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

John B. Vigushin
Patent Examiner
January 08, 2001

A handwritten signature in black ink, appearing to read 'John B. Vigushin', is written over the printed name and date.